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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,323	01/14/2002	Martin A. Cotton	2654-015	2812

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EXAMINER	
NORRIS, JEREMY C	
ART UNIT	**PAPER NUMBER**
2841	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/046,323	COTTON, MARTIN A.	
	Examiner	Art Unit	
	Jeremy C. Norris	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-21 and 24-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-21 and 24-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 19-21 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,777,620 B1 (Abe) in view of US 6,000,120 (Arledge).

Abe discloses, referring primarily to figures 1 & 2, a shielded interconnect structure for interconnecting plural devices on a printed circuit board, the shielded interconnect structure comprising; a plurality of signal lines (24), each signal line comprising : at least one first level conductive trace (24b) disposed on a upper surface of the printed circuit board, and adapted for electrical connection to one or more of the plural devices (col. 2, lines 40-45); at least one second level conductive trace (18) disposed on a buried level of the printed circuit board; at least one third level conductive trace (22) disposed on a further buried level of the printed circuit board; a conductive

shield comprising; a top shield layer (12) disposed on a upper surface of the printed circuit board, a conductive side wall (36) electrically connected to the top shield layer, and a bottom shield layer (14), electrically connected to the conductive side wall and buried within the printed circuit board at a level beneath the further buried level. Abe does not specifically disclose a plurality of trenches, each trench having at least a portion which is parallel to at least one of said signal lines and wherein at least one of said trenches is positioned between adjacent signal lines [claim 19]. However, Arledge teaches, referring primarily to figure 3, protecting a signal line (332) from crosstalk by adding conductive trenches (372) parallel to the signal line. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide conductive trenches between the signal lines, wherein the conductive side wall of the conductive shield comprise a portion of a wall of the at least one of the plurality of trenches [claim 26] in the invention of Abe as taught by Arledge. The motivation for doing so would have been to shield each signal line from crosstalk caused by the adjacent signal lines. Additionally, the modified invention of Abe wherein the top shield layer, the conductive side wall, and the bottom shield layer are formed so that the conductive shield is a unitary Faraday cage surrounding the plurality of signal lines [claim 20].

Moreover, although the modified invention of Abe does not specifically state that the conductive shield and the first, second, and third level conductive traces are formed substantially of copper [claim 21], it is well known in the art to use copper as the material for conductive portions of a circuit board as evidenced by Abe (col. 2, lines 30-

35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use copper as the material for the conductive shield and the first, second, and third level conductive traces. The motivation for doing so would have been to use a relatively inexpensive material with high electrical conductivity. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 USPQ 416.

Additionally, although the modified invention of Abe teaches via connections between the first and second layers as well as via connections between the second and third layers (col. 3, lines 1-10), the modified invention of Abe does not teach that the vias are micro vias [claims 24, 25], it is well known in the art to form via connections as micro-vias as evidenced by Arledge (col. 4, lines 5-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to form the via connections in the modified invention of Abe as micro vias as is known in the art and evidenced by Abe. The motivation for doing so would have been to reduce the size of the via needed for electrical communication. Moreover, a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 105 USPQ 237 (CCPA 1955).

Response to Arguments

Applicant's arguments with respect to claims 19-21 and 24-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCSN

Tuan Dinh

12-22-06.